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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/571,507	03/10/2006	Daisuke Itoh	WAKAB97.001APC	4217

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KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER

METZMAIER, DANIEL S

ART UNIT	PAPER NUMBER
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1762

NOTIFICATION DATE	DELIVERY MODE
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10/11/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
efiling@kmob.com
eOAPilot@kmob.com

Office Action Summary

Application No.

10/571,507

Applicant(s)

ITOH ET AL.

Examiner

DANIEL S. METZMAIER

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/21/2010; 7/19/2010; & 11/29/2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1-12 and 19-26 is/are pending in the application.
- 5a) Of the above claim(s) 6-8, 11, 12 and 22-26 is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-5, 9, 10 and 19-21 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/29/2010.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claims 1-12 and 19-26 are pending.

Election/Restrictions

1. Claims 6-8, 11-12 and 22-26 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 16 April 2009, petition filed 10 Nov. 2009, petition decision mailed 25 January 2010.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5, 9-10 and 19-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what concentration of metal particles and/or solvent is being claimed since the claims (see claim 1) limit: (i) "the content of metal nanoparticles is chosen at 40% by weight or more", (ii) "a volume percentage of said dispersion solvent is selected in the range of 55 to 80% by volume" and (iii) "a volume percentage of said dispersion solvent in the range of 20 to 50% by volume". These are not each inclusive of each other and in fact, the volume % limitations (ii) and (iii) are mutually exclusive. It is unclear what are the metes and bounds of the compositions being claimed, whether a concentrate is being claimed and what is the scope of the viscosities. No distinction is

gleamed from the terms “said metal nanoparticle dispersion” and “a concentrated dispersion” since a concentrated dispersion is a metal nanoparticle dispersion.

If applicants intend a proviso statement (*e.g.*, “. . . when a concentrated dispersion is formed by evaporating part of the dispersion solvent, resulting in the concentrated dispersion solvent in the range of 20 to 50% by volume . . .”), the viscosity property should be **conditionally stated** as such.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-5, 9-10 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al, US PG PUB 2003/0116057 A1.

Initially, the instant claims are characterized by claim 1 as representative:

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1. A metal nanoparticle dispersion usable for layered coating by spraying in the form of fine droplets,

wherein an average particle size of said metal nanoparticles is selected in the range of 1 to 100 nm, and in the metal nanoparticle dispersion, the content of metal nanoparticles is chosen at 40% by weight or more;

the metal nanoparticle dispersion is a dispersion comprising said metal nanoparticles uniformly dispersed, as a solid component, in a dispersion solvent;

the surface of the metal nanoparticle is coated with one compound or more which has a group containing a nitrogen, oxygen or sulfur atom and capable of coordinate-bonding by lone pairs existing in these atoms as a group capable of coordinate-bonding to a metal element contained in the metal nanoparticle;

the coating of said one or more compounds having the group containing the nitrogen, oxygen or sulfur atom on the surface of the metal nanoparticles is attained through the coordinate-bonding of the group containing the nitrogen, oxygen or sulfur atom to the metal element by the lone pairs existing in the nitrogen, oxygen or sulfur atom contained in the group:

said one or more compounds having the group containing the nitrogen, oxygen or sulfur atom is contained in a total amount of 10 to 50 parts by weight based on 100 parts by weight of said metal nanoparticles;

said dispersion solvent is a type of organic solvent or a mixed solvent of two or more organic liquids, which shows homogeneous liquid state at least at a temperature of 15°C or higher, wherein the type of organic solvent or at least one of the two or more organic liquids, which composes the dispersion solvent, has affinity for said one compound or more having the group containing the nitrogen, oxygen or sulfur atom;

a fluid viscosity (20°C) of the dispersion solvent is chosen from 10 mPa•s or lower;

in said metal nanoparticle dispersion, a volume percentage of said dispersion solvent is selected in the range of 55 to 80% by volume, and a fluid

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viscosity (20 °C) of the metal nanoparticle dispersion is chosen in the range of 2 mPa•s to 30 mPa•s; and

a concentrated dispersion that is formed by concentration such that a part of the dispersion solvent contained in said metal nanoparticle dispersion is removed by evaporating so to set a volume percentage of said dispersion solvent in the range of 20 to 50% by volume comes to be a viscous concentrated solution having a fluid viscosity (20 °C) being within the range of 20 Pa•s to 1000 Pa•s.

Suzuki et al teaches the following elements of the claim, presented here as presented in the claim.

Suzuki et al discloses throughout (abstract and at least [0006], [0015], and [0016]) said reference that the particles are not more than 100 nm in diameter and (examples) exemplified metal nanoparticles of 8 and 10 nm. Suzuki et al ([0012] and examples) discloses concentrations of nanoparticles of up to 80 wt % and concentrates the exemplified compositions to 80 wt %.

Suzuki et al (abstract, [0006] and [0017]-[0019]) disclose said one or more compounds having the group containing the nitrogen, oxygen or sulfur and would have been expected to bond with coordinate bond with the metals due to their lone pair electrons. Suzuki et al ([0008] and [0020]) disclose the compounds are employed at 0.1 to 10 wt % based on the nanoparticles. The range of Suzuki et al has the overlapping point of 10 wt %. See MPEP 2144.05(I) wherein it sets forth, "A *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same

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properties. ***Titanium Metals Corp. of America v. Banner***, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).”

Suzuki et al ([0022] and examples) disclose solvents reading on those claimed. Suzuki et al ([0022]) disclose several solvents having that would be expected to be homogenous liquids at 15° C or higher. Said several solvents have a fluid viscosity of 10 mPa•s or lower. See for example decane or decanol.

While Suzuki et al is silent regarding the solvent concentrations of the concentrate based on volume % and the associated viscosities, said concentrations and viscosities would have been obvious to one of ordinary skilled in the art at the time of applicants’ invention since compositions substantially as claimed are disclosed in Suzuki et al. Furthermore, Suzuki et al ([0020]) discloses an increase in concentration of the dispersing agents above the 10 wt % results in high viscosity compositions having a gel-like appearance. “A *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. ***Titanium Metals Corp. of America v. Banner***, *supra*.

Suzuki et al ([0012] and examples) discloses concentrations of nanoparticles of up to 80 wt % and concentrates the exemplified compositions to 80 wt %. Suzuki et al (examples) discloses 25 wt % dispersions having a viscosity of 8 mPa•s and a 80 wt % concentrate having a viscosity of 40 or 45 mPa•s. The viscosity of lower concentration metal nanoparticle dispersions (*e.g.*, 40 wt % up to 80 wt %) would have been expected to have been somewhere between the 25 wt % and 80 wt % dispersions and the

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viscosity would have been expected to have been further modified by the dispersants, which were added at 7 or 8 parts per 100 parts by weight of the metal particles for the noted examples. Some variation in viscosity would have been expected for increases in the dispersant concentrations as taught in the Suzuki et al reference. Applicants have not shown the viscosity differences to be unexpected and non-obvious.

Response to Arguments

7. Applicant's arguments with respect to claims 1-5, 9-10 and 19-21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Abe et al, US PG PUB 2003/0110978 A1, discloses similar dispersions to those disclosed in the Suzuki et al, US PG PUB 2003/0116057 A1, reference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL S. METZMAIER whose telephone number is (571)272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David W. Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/DANIEL S. METZMAIER/
Primary Examiner, Art Unit 1762**

DSM